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Aortic valve surgery after previous coronary artery bypass grafting with functioning internal mammary artery grafts

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Background. Aortic valve surgery after coronary artery bypass grafting (CABG) in the setting of patent pedicled internal mammary artery (IMA) grafts poses a high risk because of the underlying ischemic and valve disease. Unlike mitral valve surgery or CABG, in which aortic clamping (AoX) may be optional, aortic valve surgery uniformly requires AoX unless circulatory arrest is used. Management of the IMA graft in these circumstances has traditionally involved dissection and clamping to prevent regional myocardial warming and cardioplegia "washout" during AoX. An alternative strategy involves avoiding dissection of the IMA, leaving the IMA graft open and establishing moderate-to-deep hypothermia during AoX and cardioplegic arrest. To date, no study has been published documenting the safety and efficacy of the latter practice.

Methods. A total of 94 patients who had patent IMA graft and underwent aortic valve surgery under AoX and cardioplegia between April 1992 and March 2001 were analyzed. The IMA was avoided and left open during AoX, and the patients were cooled systemically (median 20°C). Patients ranged in age from 55 to 90 years (median 73.5 years). Ejection fraction was 15% to 83% (median 50%). Of the patients, 18 (19%) underwent minimally invasive upper hemi-resternotomy. Analysis for predictors of outcome was performed.

Results. The operative mortality, perioperative myocardial infarction (MI), and stroke rates were 6.4%,

7%, and 11%, respectively. No significant independent predictors of operative mortality or MI could be identified in the multivariate analysis, although a trend was shown for operative mortality with urgent procedures and patients requiring concomitant surgery of the ascending or arch aorta or aortic root. Advanced age and prolonged cardiopulmonary bypass predicted stroke in the multivariate analysis. There were five (5%) IMA injuries, all occurring during reentry or mediastinal dissection, but none in the subgroup of patients who underwent minimally invasive procedures. All patients survived.

Conclusions. Patients undergoing aortic valve surgery after CABG in the presence of patent IMA represent a potentially high-risk group. Because AoX is almost uniformly required, a decision regarding the management of the IMA pedicle is needed. We have found that leaving the IMA undissected and unclamped is a reasonable strategy, provided that systemic cooling for myocardial protection is established to prevent regional warming and to compensate for cardioplegia washout effect during AoX.

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